



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,106	03/29/2004	Robert K Prud'homme	2004-IP-013477	1509

7590 12/30/2005

Robert A. Kent
Halliburton Energy Services
2600 S. 2nd Street
Duncan, OK 73536-0440

EXAMINER

RICHARD, CHARLES R

ART UNIT	PAPER NUMBER
----------	--------------

1712

DATE MAILED: 12/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,106

Applicant(s)

PRUD'HOMME ET AL.

Examiner

C. R. Richard

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-93 is/are pending in the application.
- 4a) Of the above claim(s) 1-53 and 85-93 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 54-84 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-93 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/29/04 & 9/6/05</u> | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-10, drawn to a method of viscosifying a treatment fluid, classified in class 34, subclass 303.
 - II. Claims 11-18, drawn to a method of suspending particles in a treatment fluid, classified in class 516, subclass 9.
 - III. Claims 19-31, drawn to a method of treating a section of a subterranean formation, classified in class 166, subclass 305.1.
 - IV. Claims 32-39, drawn to a method of fracturing, classified in class 166, subclass 308.1.
 - V. Claims 40-47, drawn to a method of sand control, classified in class 166, subclass 278.
 - VI. Claims 48-53, drawn to a method of encapsulating a treatment fluid additive, classified in class 427, subclass 213.3.
 - VII. Claims 54-84, drawn to a viscosified treatment fluid (and related fracturing and gravel packing fluids), classified in class 507, subclass 219.
 - VIII. Claims 85-87, drawn to a polymersome, classified in class 524, subclass 379.
 - IX. Claims 88-93, drawn to an encapsulated treatment fluid additive, classified in class 507, subclass 902.

The inventions are distinct, each from the other because of the following reasons:

Inventions I-IV are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combinations as claimed do not require the particulars of the subcombination as claimed for patentability in that they all have an extra or distinct step that sets them apart. The subcombinations have separate utility in generic methods other than that carried forward by the combination.

Inventions I-III & V are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combinations as claimed do not require the particulars of the subcombination as claimed for patentability in that they all have an extra or distinct step that sets them apart. The subcombinations have separate utility in generic methods other than that carried forward by the combination.

Inventions IV and V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In

Art Unit: 1712

the instant case, the different inventions are to the distinct and separate methods of fracturing and sand control.

Inventions I-V are unrelated to invention VI. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case, encapsulating (invention VI) is separate and distinct from the others.

Inventions I-II and VII are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process may be used to make a non-aqueous fluid.

Inventions III-V and VII are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product could be used as a hydraulic fluid in an above ground process.

Inventions VI and VII are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of

Art Unit: 1712

operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case, encapsulating (VI) is not involved in making the treatment fluid (VII).

Inventions I-II & VII and VIII are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combinations as claimed do not require the specific polymersome of invention VIII. Polymersomes can be used in drug delivery.

Inventions III-VI and VIII are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the process could be performed with a type of polymersome other than that of invention VIII.

Inventions I-V & VII and IX are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case, an encapsulated additive (IX) is not involved in the method inventions I-V nor in the fluids of invention VII.

Inventions VI and IX are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the

process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process may be used to make only a partially encapsulated additive.

Inventions VIII and IX are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combinations as claimed do not require the specific polymersome of invention VIII. Polymersomes can be used in drug delivery.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Applicant's attorney, Robert Kent, on December 15, 2005, a provisional election was made without traverse to prosecute the invention of group VII (claims 54-84). Affirmation of this election must be made by Applicant in replying to this Office action. Claims 1-53 and 85-93 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

2. The drawings are objected to as follows. Details of figures 2, 5 and 6 are not discernable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required

Art Unit: 1712

in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 54-61, 67-73 and 76-82 are rejected under 35 U.S.C. 102(b) as being anticipated by Heitz et al. in US Patent Application Publication 2002/0161087.

Heitz discloses a hydraulic fracturing fluid comprising an aqueous liquid, and a block copolymer containing at least one water soluble block and one hydrophobic block (see Abstract). The weight ratio of the water soluble to hydrophobic block may be 95:5 to 20:80 or 90:10 to 40:60 (see page 2, paragraph 21). In general, the hydrophobic monomers may be chosen from styrene, butadiene and alkyl (meth)acrylates; styrene is preferred (see page 3, paragraph 53-57). The hydrophilic monomers may be chosen from monomers such as acrylic acid, methacrylic acid, acrylamide, 2-acrylamido-2-methylpropanesulphonate and quaternized 2-dimethylaminoethylethyl methacrylate (see page 3, paragraph 58-66). The copolymer is present at 0.1 to 10, 0.5 to 5 or 1 to 3 weight percent (see page 5, paragraph 114). Proppants may be added such as gravel or sand (see page 5, paragraph 116).

It is noted that the block copolymers make for a viscoelastic medium when included in the fluids described (see page 2, paragraph 19). A washing, dialysis and precipitation of the polymer are mentioned (see page 5, paragraph 112). Given this and that the composition of the copolymers disclosed is the same as in the present invention, the formation of at least some polymersomes is inherent. The fluids of Heitz are taught for fracturing, but would also be useful as treatment fluids generally and for gravel packing – in the latter case, at least when the proppant used is gravel (see above).

As to claims 59, 72 and 81, a proper level of polymersome is inherent given the copolymer weight percents above and that at least a small percentage copolymer is present as polymersome.

5. Claims 54-58, 60 and 67-71 are rejected under 35 U.S.C. 102(b) as being anticipated by disclosures in Discher et al. in 297 Science 967 of 9 August 2002. Polymersomes from block copolymers in aqueous solution are discussed where mass fraction hydrophilic block is 35 +/- 10%, and a copolymer of polyethylene oxide-polybutadiene is mentioned (see page 970). These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating and fracturing fluids, so Applicant's intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

6. Claims 54-58, 60 and 67-71 are rejected under 35 U.S.C. 102(b) as being anticipated by disclosures in Dimova et al. in 7 Eur. Phys. J. E 241 published in 2002. This article concerns polymersome made with a diblock copolymer of polybutadiene and polyethylene oxide (see Abstract). A PB32-PEO20 polymer is used which is about 33 weight percent hydrophilic (PEO) (see page 242). The polymersomes are formed in water/aqueous solution (see page 242). These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating and fracturing fluids, so Applicant's intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

7. Claims 54-57, 60-61, 63-64, 67-70, 73, 75-79 and 84 are rejected under 35 U.S.C. 102(b) as being anticipated by Churchill et al. in US Patent 4,745,160. Churchill discloses a block copolymer dispersible in water (see Abstract). The copolymer may be made of blocks of hydrophobic polymer and hydrophilic polymer (see column 4, lines 10-24). The hydrophobic polymer may be polylactide, polyglycolide or a polyorthoester (see column 4, lines 25-50). The hydrophilic polymer may be polyethylene oxide, polyacrylamide and polyvinylpyrrolidone among others (see column 5, lines 5-10). A 25:75 by weight hydrophilic:hydrophobic block copolymer is given in Example 1, where the hydrophobic block is polylactide; at least some polymersomes in aqueous solution would be inherently produced in this procedure, and the polymersome and the acid-releasing material are the same. This later mixture is a dispersion of particles. Note also the procedure outlined in column 3 as to inherent polymersome production. These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating, fracturing and gravel pack fluids, so Applicant's intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

8. Claims 54-62, 67-74 and 76-81 and 83 are rejected under 35 U.S.C. 102(e) as being anticipated by Discher et al. in US Patent 6,835,394. Discher discloses the formation of polymersomes in aqueous solution (see column 4, lines 35-52). The polymersomes may be formed from block copolymers where the hydrophilic block is 20 to 50 percent by weight (see column 5, lines 2-6). Useful blocks include polyethylene

Art Unit: 1712

oxide, polybutadiene, polystyrene and polyisoprene (see column 5, lines 15-21). These polymersomes may be used to encapsulate other materials, and so act as particulates (see column 5, lines 45-53). Some of polymersome copolymers are given in Table 1 in column 13 and Table 2 in column 15 which include polyethylene oxide-polybutadiene. Polymersomes may be placed in phosphate buffered saline solution (see column 21, lines 45-57). The polymersome content of some aqueous solutions made was reported at 0.01 to 1.0 weight percent (see column 16, lines 57-67). These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating, fracturing and gravel packing fluids, so Applicant's intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 54-81 and 83-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Discher et al. in US Patent 6,835,394 in view of Joanicot et al. in US Patent Application Publication 2004/0010060, Dovan et al. in US Patent 5,226,480 and Cooke in US Patent Application Publication 2003/0060374.

Discher has been discussed above; the polymersomes there may be used to encapsulate other materials as stated there. This reference discloses all of the limitations of the rejected claims, except for pH adjusting and acid and base releasing materials of the rejected claims.

Joanicot discloses block copolymer based vesicles that are at least similar to polymersomes. These vesicles may carry "any hydrophilic active that may be introduced in a classical vesicle..." (see page 9, paragraph 207), but solid actives may be used that are not necessarily water soluble (see page 9, paragraph 208); included are those for oil field use (as in fracturing) with some more specific examples being as cross linking catalysts and as materials that degrade polysaccharides such as a carboxylic acid (see page 9, paragraph 215) – this would suggest (poly)lactides, (poly)glycolides, urea, etc to one of ordinary skill in the art. Specifically cited examples include hydrochloric acid (see page 9, paragraph 216).

Relating to the teachings of Joanicot are Dovan showing the use of urea as a base precursor in an oil field application (see claim 1 there), and Cooke which discusses the use of polylactides in well bores (see page 3, paragraph 22 there).

It would have thus been obvious for one of ordinary skill in the art to use the actives taught or suggested by Joanicot (in view of Dovan and Cooke) in the polymersomes of Discher, given the teachings Joanicot that they may be used in vesicles.

Conclusion


11. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure: US Patents 6,541,033 and 6,916,488.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. R. Richard whose telephone number is 571-272-8502. The examiner can normally be reached on M-Th, 8am-6pm and alternate Fridays, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles N. Richard


PHILIP TUCKER
PRIMARY EXAMINER
ART UNIT 1712